

WHAT IS CLAIMED IS:

1. A system for issuing an authentication certificate used in personal authentication, comprising:
 - 5 reaction means for reacting a DNA array having a known probe layout with DNA of a given person; and
issuing means for issuing an authentication certificate where there is a pattern of hybridized probes obtained by said reaction means for the
10 authentication certificate.
 2. The system according to claim 1, wherein said issuing means issues the authentication certificate by attaching the reacted DNA array obtained by said reaction means to the base.
 - 15 3. The system according to claim 1, wherein said issuing means issues the authentication certificate on which layout information that expresses positions of hybridized probes using numerical values is recorded.
 4. The system according to claim 3, wherein the
20 layout information is magnetically recorded.
 5. The system according to claim 3, wherein the layout information is recorded in the form of digital information.
 6. The system according to claim 3, wherein the DNA
25 array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and column addresses.

7. The system according to claim 1, wherein DNA
5 probes of the DNA array comprise gene probes associated with major histocompatibility complex antigens.

8. The system according to claim 1, wherein DNA
probes of the DNA array comprise gene probes associated
with major histocompatibility complex antigens and
10 single nucleotide polymorphisms.

9. The system according to claim 1, further
comprising extraction means for extracting DNA from a
blood sample, and providing the DNA to said reaction
means.

15 10. The system according to claim 1, wherein a
substrate on which the base and the DNA array are
integrally formed is used.

11. A method for issuing an authentication
certificate used in personal authentication,
20 comprising:

the reaction step of reacting a DNA array having
a known probe layout with DNA of a given person; and

the issuing step of issuing an authentication
certificate where there is a pattern of hybridized
25 probes obtained in the reaction step for the
authentication certificate.

12. The method according to claim 11, wherein the issuing means includes the step of issuing the authentication certificate by attaching the reacted DNA array obtained in the reaction step to the base.

5 13. The method according to claim 11, wherein the issuing step includes the step of issuing the authentication certificate on which layout information that expresses positions of hybridized probes using numerical values is recorded.

10 14. The method according to claim 13, wherein the layout information is magnetically recorded.

15 15. The method according to claim 13, wherein the layout information is recorded in the form of digital information.

16 16. The method according to claim 13, wherein the DNA array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and column addresses.

20 17. The method according to claim 11, wherein DNA probes of the DNA array comprise gene probes associated with major histocompatibility complex antigens.

18. The method according to claim 11, wherein DNA probes of the DNA array comprise gene probes associated with major histocompatibility complex antigens and single nucleotide polymorphisms.

blood sample, and providing the DNA to said reaction means.

25. An authentication system for personal authentication, comprising:

- 5 storage means for storing registration information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person;
- 10 acquisition means for acquiring the layout information from an authentication certificate;
- generation means for generating authentication information on the basis of the layout information acquired by said acquisition means; and
- 15 authentication means for making authentication by collating the authentication information generated by said generation means with the registration information stored in said storage means.
26. The system according to claim 25, wherein the
- 20 registration information and authentication information contain the layout information and type information used to specify a probe layout on the DNA array.
27. The system according to claim 25, wherein the layout information includes data that represent
- 25 positions of the hybridized probes on the DNA array by coordinate values.

28. The system according to claim 25, wherein the authentication certificate includes a reacted DNA array on which a reaction pattern is formed upon reaction with a DNA of a given person, and

5 said acquisition means comprises a scanner for reading the hybridized pattern of the reacted DNA array as an image, and conversion means for detecting probes after reaction from the read image, and converting the detected probes into the layout information.

10 29. The system according to claim 25, wherein the authentication certificate records the layout information as digital information, and

 said acquisition means acquires the layout information by reading the digital information.

15 30. The system according to claim 25, wherein the authentication certificate records the layout information as magnetic information, and

 said acquisition means acquires the layout information by reading the magnetic information.

20 31. The system according to claim 25, further comprising registration means for storing the authentication information generated by said generation means in said storage means as the registration information.

25 32. The system according to claim 25, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens.

33. The system according to claim 25, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens and single nucleotide polymorphisms.

- 5 34. The system according to claim 25, wherein the DNA array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and
10 column addresses.

35. The system according to claim 25, wherein the authentication information and registration information contain person specifying information for specifying a given person, and

- 15 said authentication means makes authentication by searching said storage means for registration information which contains the same person specifying information as the person specifying information contained in the authentication information generated
20 by said generation means, and collating the layout information of the generated authentication information and the registration information found by search.

36. The system according to claim 25, wherein an apparatus having said acquisition means and said
25 generation means, and an apparatus having said storage means and said authentication means are connected via

the Internet, and the authentication information is sent via the Internet.

37. An apparatus for sending an authentication request to an external apparatus, comprising:

- 5 acquisition means for acquiring layout information that represents a layout pattern of reaction probes obtained by reacting a DNA array on which a plurality of probes are arranged by reading an authentication certificate;
- 10 generation means for generating authentication information on the basis of the layout information acquired by said acquisition means;
- registration request means for sending the authentication information to the external apparatus to
- 15 request user registration; and
- authentication request means for sending the authentication information to the external apparatus to request authentication.

38. An apparatus for making user authentication in response to an authentication request from an external apparatus, comprising:

- 25 reception means for receiving authentication information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, and

instruction information indicating a registration request or authentication request;

registration means for, when the instruction information indicates the registration request, making
5 user registration on the basis of the authentication information received by said reception means; and

authentication means for, when the instruction information indicates the authentication request, making user authentication on the basis of the
10 authentication information received by said reception means, and registration contents registered by said registration means.

39. An authentication method for personal authentication using storage means for storing
15 registration information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, comprising:

20 the acquisition step of acquiring the layout information from an authentication certificate;

the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step; and

25 the authentication step of making authentication by collating the authentication information generated

in the generation step with the registration information stored in said storage means.

40. The method according to claim 39, wherein the registration information and authentication information
5 contain the layout information and type information used to specify a probe layout on the DNA array.

41. The method according to claim 39, wherein the layout information includes data that represent
positions of the hybridized probes on the DNA array by
10 coordinate values.

42. The method according to claim 39, wherein the authentication certificate includes a reacted DNA array
on which a reaction pattern is formed upon reaction
with a DNA of a given person, and

15 the acquisition step comprises the conversion step of detecting probes after reaction from an image read by a scanner for reading the reaction pattern of the reacted DNA array as an image, and converting the detected probes into the layout information.

20 43. The method according to claim 39, wherein the authentication certificate records the layout information as digital information, and

the acquisition step includes the step of
acquiring the layout information by reading the digital
25 information.

44. The method according to claim 39, wherein the authentication certificate records the layout information as magnetic information, and

the acquisition step includes the step of
5 acquiring the layout information by reading the magnetic information.

45. The method according to claim 39, further comprising the registration step of storing the authentication information generated in the generation
10 step in said storage means as the registration information.

46. The method according to claim 39, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens.

15 47. The method according to claim 39, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens and single nucleotide polymorphisms.

48. The method according to claim 39, wherein the DNA
20 array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and column addresses.

25 49. The method according to claim 39, wherein the authentication information and registration information

contain person specifying information for specifying a given person, and

the authentication step includes the step of making authentication by searching said storage means
5 for registration information which contains the same person specifying information as the person specifying information contained in the authentication information generated in the generation step, and collating the layout information of the generated authentication
10 information and the registration information found by search.

50. The method according to claim 39, wherein an apparatus having the acquisition step and the generation step, and an apparatus having said storage
15 means and the authentication step are connected via the Internet, and the authentication information is sent via the Internet.

51. A method for sending an authentication request to an external apparatus, comprising:

20 the acquisition step of acquiring layout information that represents a layout pattern of reaction probes obtained by reacting a DNA array on which a plurality of probes are arranged by reading an authentication certificate;

25 the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step;

the authentication request step of sending the
5 authentication information to the external apparatus to
request authentication.

52. A method for making user authentication in response to an authentication request from an external apparatus, comprising:

10 the reception step of receiving authentication
information which includes layout information that
represents a layout pattern of reaction probes obtained
by reacting a DNA array on which a plurality of probes
are arranged with DNA of a given person, and
15 instruction information indicating a registration
request or authentication request;

the registration step of making, when the instruction information indicates the registration request, user registration on the basis of the authentication information received in the reception step; and

the authentication step of making, when the instruction information indicates the authentication request, user authentication on the basis of the authentication information received in the reception
25 step, and registration contents registered in the registration step.

a base; and

a holding portion for making said base hold

5 information that represents a layout pattern of
reaction probes obtained by reacting a DNA array having
a known layout of a plurality of probes with DNA of the
person.

54. The certificate according to claim 53, wherein
10 said holding portion holds the information that
represents the layout pattern of the reaction probes by
attaching the reacted DNA array.

55. The certificate according to claim 53, wherein
said holding portion holds the information that
15 represents the layout pattern of the hybridized probes
by one of magnetic recording and digital recording.

56. The certificate according to claim 55, wherein the DNA array is formed by arranging a plurality of probes in row and column directions, and

20 the information that represents the layout pattern of the reaction probes contains position information which expresses positions of the hybridized probes on the DNA array by row and column addresses.

57. A computer readable medium which stores a control
25 program for making a computer execute an authentication
process for personal authentication using storage means
for storing registration information which includes

layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, said control program comprising:

5 a code of the acquisition step of acquiring the layout information from an authentication certificate;

 a code of the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step; and

10 a code of the authentication step of making authentication by collating the authentication information generated in the generation step with the registration information stored in said storage means.

58. A computer readable program which stores a

15 control program for making a computer execute an authentication process for making authentication using an authentication certificate attached with a layout pattern of hybridized probes on a DNA array on which a plurality of probes are arranged, said control program
20 comprising:

 a code of the acquisition step of acquiring layout information that represents the layout pattern of the hybridized probes by reading the authentication certificate;

25 a code of the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step;

a code of the registration request step of sending the authentication information to the external apparatus to request user registration; and

- a code of the authentication request step of
5 sending the authentication information to the external apparatus to request authentication.

59. A computer readable medium which stores a control program for making a computer execute an authentication process for making authentication on the basis of
10 layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, said control program comprising:

- a code of the input step of inputting
15 authentication information containing the layout information, and instruction information indicating a registration request or authentication request;

a code of the registration step of making, when the instruction information indicates the registration
20 request, user registration on the basis of the authentication information received in the reception step; and

- a code of the authentication step of making, when the instruction information indicates the
25 authentication request, user authentication on the basis of the authentication information received in the

reception step, and registration contents registered in
the registration step.

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